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Thesis

THE INFLUENCE OF STAMMERING UPON THE ACHIEVEMENT OF SCHOOL CHILDREN

by

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CONTENTS

1. Introduction

Good speech is universally recognized as a vitally important factor in the social adjustment of the individual. Conspicuous abnormalities of speech have long been recognized as serious hindrances to social and economic adjustment. It is only within the past ten years, however, that progressive educational administrators in this country have begun slowly to realize that such abnormalities must be dealt with as educational problems. Stammering, which includes stuttering, is the most serious kind of speech defect. In this paper an attempt will be made to investigate to some extent the influence of stammering upon the school achievement of children who are afflicted with it.

Stammering Defined

The majority of speech specialists are agreed that stammering is a functional disturbance of speech, psychic in origin, and likely to be imposed upon a nervous constitution. Martin[1] defines stammering as "a halting defective speech characterized by a transient hesitancy in producing a sound, or in passing from one sound to another." He adds that the stammerer will often come to an absolute halt in his speech, being unable to produce voice. He describes stuttering as "an analogous form of speech characterized by the repetition of a sound, letter, word, or phrase before passing on to the next. It is, in

1. Martin, Frederick and Louise, "Manual of Speech Training," p. 11. Published by the Authors, 1926, Ithaca, N. Y.

the majority of cases, an incipient form of stammering." Blanton[1] says that the genesis of both stammering and stuttering is quite the same. He uses the term stuttering to include stammering, and defines the defect as "a breaking of the rhythm of speech, due to a blocking or inhibiting of the muscular coordinations." Bluemel[2] says that "stammering is a disturbance of thought, and it manifests itself in speech merely because speech produces thought." In many instances the defect is accompanied by acute twitching of the facial muscles or the muscles of the arms or legs. In this paper all degrees of the defect from stuttering to acute, chronic stammering will be included in the term stammering.

Stammering in Relation to School Achievement

Although all speech authorities are agreed that the stammerer does not present a mentality markedly different from that of the non-stammerer, the belief is general that he does not succeed as well in school work because of the inhibitive effect of his abnormal speech upon his ability to respond orally and his tendency to feel deeply inferior to his classmates. Root[3], in his 1926 study, reports the mean number of months of school retardation as 9. for male and 8.5 for female

1. Blanton, Margaret G. and Smiley, "Speech Training for Children," p. 100. Century Co., New York. 1924

2. Bluemel, C. S., "Mental Aspects of Stammering," p. 16. Williams and Wilkins Co., Baltimore. 1930

3. Root, A. R., "A Survey of Speech Defectives in the Public Elementary Schools of South Dakota." Elementary School Journal, Vol. 26, March, 1926. pp. 531-541.

stammerers. Conradi's study[1] of 87,440 cases shows a range of 4 to 9 months of retardation. Martin[2] claims that the stammerer loses from one to three years of school life. Fletcher[3] summarizes various studies all of which indicate that the stammerer is retarded approximately a year in school achievement. McDowell[4] asserts that there is no significant disparity in school achievement between stammerers and non-stammerers. She adds that the data obtained in her study challenge the claim of many writers who believe stuttering a direct cause of retardation.

II. Various Frequencies of Stammering in School Populations

Terman[5] says that the number of stutterers exceed the number of deaf, blind, and insane. Both he and Fletcher[6] have summarized the estimated frequency of the defect in school populations made by other investigators. The results follow:

1. Conradi, Edward, "Speech Defects and Educational Progress," pp. 35-38. Journal of Educational Psychology, 111, 1912.

2. Martin, Frederick, "Speech Clinic Lectures," 1925. Unpublished. Martin Speech Clinic, Ithaca, N. Y.

3. Fletcher, John M., "The Problem of Stuttering," p. 79. Longmans, Green Co., New York, 1928.

4. McDowell, Elizabeth D., "Educational and Emotional Adjustments of Stuttering Children." Contributions to Education, No. 314, Teachers College, Columbia University.

5. Terman, Lewis M. and Almack, John C. "The Hygiene of the School Child," p. 348. Revised and enlarged edition. Houghton Mifflin Co., Boston, 1928.

6. Fletcher (Ibid. 4, p. 79)

American Investigators	Children	Per cent Stammering
Wallin	89,057	.7
Blanton	5,000	.72
Hartwell	?	.78
Conradi	87,440	1.72
Root	14,072	1.2
Root (1927)[1]	37,824	2.2
Camp	?	2.64

Foreign Investigators	Children	Per cent Stammering
Westgaard (Denmark)	34,000	.61
Lindberg (Denmark)	212,000	.9
Lindberg (Denmark)	85,000	.74
Von Sarbo (Hungary)	231,000	1.02
Rouma (Belgium)	14,235	1.4

The exact method of securing the data in these investigations was not reported, but the results give some idea of the frequency of the defect in school populations, and the findings are fairly consistent.

The estimates of Root, 2.2% in his 1927 survey, and that of Miss Camp, which was 2.64%, are consistent with the findings in a survey of 488 stammering children who were in Speech Correction Classes in the Providence Public Schools during the term of September 1930 to the end of January 1931. These children came from four senior high schools, four junior high schools, and forty-two elementary schools. Thirty-four elementary schools had no classes for corrective speech work, hence they do not enter into the study. As the Providence plan of grade organization is in the transition stage from the 8-4

1. Root, A. R. "Educational Administration and Supervision," Vol. 13, "Special Education and the Speech Defective." pp. 255-265. April, 1927.

plan to the 6-3-3 plan, grades in the elementary schools ranged as follows: 1-8, 5-8, 5-6, 4-6, 1-5, and 1 to 2, 3, and 4. The following table shows the percentage of the pupils who were classed as stammerers:

Schools	% Boys	% Girls	Total %
Senior High	.04	.01	.05
Junior High	.06	.01	.07
Grammar (5-8)	.67	.42	1.10
Primary (1-4)	.72	.22	.94
Total per cent	1.49	.66	2.16

The great incidence in this table is due, probably, to the fact that it represents the per cent of the actual population of the schools from which these stammering children were drawn for the speech correction classes, and also to the fact that they were located through careful survey by speech specialists.

Frequency in Relation to Sex

All authorities agree that sex is an important factor in stammering, for all investigations reveal a great excess of boys over girls. Fletcher[1] reports estimates of sex differences to range from 2 to 1, to 10 to 1. He adds that "the rate changes with age, so that the greater the age the greater the preponderance of male over female stutterers." He believes that males are more likely to acquire the defect and to continue it once it has been acquired. Martin[2] says that statistics show

1. Fletcher, "The Problem of Stuttering," p. 57.
2. Martin, "Manual of Speech Training," p. 15.

that about 84 per cent of the cases are males. Terman and Almack[1] report an estimated ratio by speech authorities to be about 3 to 1. Greene[2] says that "there are five or six stuttering boys to one stuttering girl." In a report of 10,268 stammerers made by West[3] the ratio was approximately 4 to 1, 79.6 per cent boys and 20.4 per cent girls. West's ratio is in agreement with the ratio of stammering children in the Providence Public School classes for the correction of speech defects. Of the 1,338 children receiving corrective speech treatment from September 1929 to June 1930, 716 were stammerers. Of this number, 79.2 per cent were boys and 20.8 per cent were girls. Approximately the same ratio was found during the past term, September 1930 to February 1931, in a study of 488 stammerers. Of this number, 79.5 per cent were boys and 20.5 per cent were girls. West believes that the great male incidence is due to the rapid increase in their numbers between the ages of six and twelve years. Many other speculations are advanced as to the cause of this wide sex difference in incidence. Two outstanding ones are based upon the physiological sex differences and the tendency of boys to react emotionally toward the restraint of the home environment.

Frequency of Distribution by School Grades

The general belief among authorities on defective speech

1. Terman and Almack, "The Hygiene of the School Child." p. 349
2. Greene, James S. and Wells, Emilie J., "The Cause and Cure of Speech Disorders," p. 76. Macmillan Co., N. Y., 1927.
3. West, Robert, University of Wisconsin. Mimeographed, 1930.

is that stammering has its beginning in early childhood during the plastic years from three to nine when speech habits are being "set," although it is not recognized until it becomes acute enough to interfere with speech fluency. Its onset is so gradual that it often passes unnoticed in the clumsy muscular speech coordinations of the young child until some period of emotional stress, which may have a psychic or physiological cause, when it is noted as a marked abnormality. Therefore, it often passes unrecognized in the pre-school years and in the first and second years of school life. A study of the frequency distribution by grades of 488 stammering children in the Providence Schools shows grade placement on Table 1, page 8.

It will be noted in this table that the frequency for both boys and girls is low in the first and second grades, 2.3 per cent for boys and 7. per cent for girls. This finding seems in agreement with the opinion that the defect is often unrecognized by parents and teachers in the early school years. However, it might have been slightly higher in this instance if all primary schools in the city were included in the study. The low frequency in the senior high schools is largely due to the fact that it is difficult to arrange a corrective speech schedule which will fit in with the subject schedule of all of the pupils who need speech aid. It will be noted that the frequency for boys from eight to fourteen years of age is extremely high, 96.5 per cent, with the highest frequency, 36.6 per cent, from the tenth through the eleventh year of age. The frequency for girls

Frequency Distribution of 488 Stammerers by Grade

388 Boys

Grade Age	6		7		8		9		10		11		12		13		14		15		16		17	
Grade	1B	1A	2B	2A	3B	3A	4B	4A	5B	5A	6B	6A	7B	7A	8B	8A	9B	9A	10B	10A	11B	11A	12B	12A
Boys	3	2	1	3	10	20	25	25	39	32	44	27	40	25	24	20	15	13	9	3	2	3	1	2
Per cent	1.3		1.		7.8		12.8		18.3		18.3		17.		11.2		7.1		3.		1.5		.7	

Schools	Cases	Per cent	Grades	Approximate ages
Senior High	20	5.2	10, 11, 12	15-17½ years
Junior High	137	35.3	7, 8, 9	12-14 years
Elementary	80	20.6	3, 4,	8-9 years
Elementary	142	36.6	5, 6,	10-11 years
Elementary	9	2.3	1, 2,	6-7 years

100 Girls

Grade Age	6		7		8		9		10		11		12		13		14		15		16		17	
Grade	1B	1A	2B	2A	3B	3A	4B	4A	5B	5A	6B	6A	7B	7A	8B	8A	9B	9A	10B	10A	11B	11A	12B	12A
Girls	3	0	2	2	4	3	9	2	14	15	11	6	4	9	2	5	0	0	2	1	1	2	1	2
Per cent	3.		4.		7.		11.		29.		17.		13.		7.		0		3.		3.		3.	

Schools	Cases	Per cent	Grades	Approximate ages
Senior High	9	9.	10, 11, 12	15-17½ years
Junior High	20	20.	7, 8, 9	12-14 years
Elementary	46	46.	5, 6,	10-11 years
Elementary	18	18	3, 4,	8-9 years
Elementary	7	7.	1, 2,	6-7 years

over the same age periods is 84 per cent, with the highest frequency of 46 per cent from the tenth through the eleventh year. Blanton[1] says that "from nine to fourteen years is a period of readjustment, of marked growth and abnormal balance of the different functions and activities, and is, therefore, a period of great psychic danger to the individual." This statement seems significant in view of the above findings, and in view of the general belief that stammering symptoms are the result of the individual's emotional reaction to a particular situation. Conradi[2] believes that stuttering is more intense during the periods of second dentition and puberty, a belief which also seems significant in view of the above findings.

Stammering in Relation to a Foreign Home Language

Greene, Peppard, and Martin believe that children who come from homes where a foreign language is spoken are likely to find difficulty in articulating English sounds fluently and readily, and therefore, are likely to develop an uncertainty of speech which may, through speech conflict, result in stammering. Peppard[3] describes speech conflict as "thinking in one language and endeavoring to speak in another." Martin[4] says that a child from a foreign language home is burdened with the

1. Blanton, "Speech Training for Children," p. 16.

2. Conradi, Edward, "Psychology and Pathology of Speech Development in the Child," Pedagogical Seminary Vol. 11, 1904, pp. 328-380.

3. Peppard, Helen M. (Mrs. Emmet K. Moore) "The Correction of Speech Defects," p. 147. Macmillan Co., N. Y., 1925.

4. Martin, Frederick, Lectures in the Martin Clinic for the Correction of Speech Defects. Unpublished. 1924-1925.

task of forming his thoughts in the foreign language and translating them into English. He says that "the child must be obliged to rearrange the verb. He must think of the English pronunciation. He must not only eliminate the foreign accent, but must change his vowel production. Hence, he must spend much mental energy before he can speak in English. His mental faculties are unable to produce the image of the word or sentence as fast as he can physically coordinate the muscles of speech to produce it, and a real psychic upset occurs, which may result in stammering in one or both languages." Greene[1] believes that speech conflict is likely to occur in impressionistic and emotional children from foreign language homes at the critical period when speech habits are becoming automatic. He describes speech conflict as "trying to balance normal English speech practice at school with the foreign language spoken at home."

Whether or not speech conflict plays a large part in causing the high incidence of stammering among the children included in this investigation is a question which will need further study. However, the Providence School Census figures may throw some light upon the problem. These figures reveal that 47 per cent of the parents of all of the children of school age, including kindergarten children, were born in the United States, England, and Ireland, and therefore use English in the home. The remaining 53 per cent of the parents were born in countries where it is probable that a foreign language predominates. It

1. Greene, James S. and Wells, Emilie, "The Cause and Cure of Speech Disorders." Macmillan, 1927. p. 24.

It is a known fact that the majority of foreign born parents are slow in adopting English, especially the Italian group which makes up 30.5 per cent of the foreign language group in this city. It is reasonable, therefore, to suspect, in view of the following figures, that speech conflict may be one of the causative factors in the high incidence of stammering in Providence Schools. Of the 488 children in this investigation, 63.7 came from foreign language homes, and 36.3 per cent came from homes where English is spoken. This proportion is in agreement with figures obtained from a check-up on 716 stammerers included in the corrective speech classes from September 1929 to June 1930. Of the number, 64.5 per cent came from foreign language homes and 35.5 per cent came from homes where English is spoken. The following table indicates the language background of the 488 stammerers who were in the corrective speech classes this past term.

Language Background of 488 Stammerers

Boys--English speaking	128	27%	
Girls--English speaking	49	10%	37% English
Boys--Foreign language	260	53%	
Girls--Foreign language	51	10%	63% Foreign
Totals	488	100%	100%

Summary of Part II.

1. The majority of speech specialists are agreed that stammering is a functional disturbance of speech which is psychic in origin. They also agree that the defect varies in degree from stuttering to acute, chronic stammering which may or may not be accompanied by acute tics of the speech, facial, or limb muscles.

2. With one exception investigators believe that stammering interferes with school achievement and may cause retardation of approximately one year. McDowell, who made a study of fifty stammerers and fifty non-stammerers, claims that there is no disparity between stammerers and non-stammerers in school achievement.

3. The frequency of the occurrence of the defect among school children is reported by investigators to range from .7 per cent to 2.64 per cent. The Providence frequency of 2.16 per cent is in agreement with the higher frequencies. This high frequency may be due to the fact that this figure represents the per cent of the actual population of the schools from which stammerers are drawn for the speech classes, or to the fact that they were located through careful survey by speech specialists.

4. The ratio between the sexes of stammering children is reported as varying from 2 to 1, to 10 to 1. A more conservative estimate is from 3 to 1, to 4 to 1. In two sep-

arate studies of Providence stammerers the ratio has been found to be approximately 4 to 1. Many speculations are offered for this wide sex difference, but more than speculation seems necessary to determine the cause.

5. The belief is general that stammering has its beginning in early childhood but often passes unrecognized until the third or fourth year of school. The age period from nine to fourteen years is considered a period of great psychic danger by Blanton, and seems to coincide with the findings in a grade frequency distribution of 488 stammering children in the Providence Public Schools. The frequency for boys eight to fourteen years of age in this study was 96.5 per cent with the highest frequency, 36.6 per cent, between ten and eleven years. For girls, the frequency over the same age period was 84 per cent with the highest frequency, 46 per cent, between the years of ten and eleven.

6. The possibility of speech conflict, due to the emotional strain of formulating thoughts in one language and expressing them in another, is considered by some authorities a contributing factor in stammering among children from foreign language homes. In a study of the language background of 488 stammerers in Providence, it was found that 63.7 per cent came from homes where a foreign language predominated, and 36.3 per cent came from homes where English only was used. A check-up of 716 stammerers in the same city revealed 64.5 per cent came from

foreign language homes and 35.5 per cent came from homes where English was spoken. This is a question which might well be investigated further in our schools.

III. A Comparative Study of 160 Stammerers and 160 Non-stammerers.

The Problem

Stammering is believed to be a serious drain upon the physical and mental energy of its victim, and it is questionable whether he is able to compete upon equal terms with the non-stammerer. In this study an attempt was made to determine whether the stammerer is able to succeed in school work as well as the non-stammerer of like ability and intelligence. The study is a non-selective one in the sense of speech or scholarship, for the speech defect of the stammering subjects varies in degree as does their scholarship. Stammerers in the speech correction classes were selected for the comparative study only when it was possible to find an equivalent control. A fair sampling of the school population makes up the study which includes 115 stammering boys and 45 stammering girls.

In order to secure as high a degree of equivalence as possible, each stammerer was matched with a non-stammerer of like sex, school grade, home language background, and approximately the same intelligence, mental age, and social status. Unfortunately, intelligence quotients determined by individual tests were not available. Group tests are used in the Providence Public Schools to obtain an IQ which serves only as a check upon school achievement in conjunction with mental and chronological ages. It is clearly realized that too great a significance cannot be placed upon an IQ obtained by means of one group test. The intelligence quotients used in this study were obtained by means of the following group tests which were

administered by trained examiners and estimated most carefully:

Grade 1	Detroit First Grade Test
Grades 2 and 3	Detroit Primary Test
Grades 4 and 5, 6B	Haggerty, Delta 2
Grades 6A-9B	Detroit Alpha
Grades 9B and 9A	Otis Self Administering, Intermediate
Grades 10B-12A	Otis Self Administering, Higher

The Intelligence of the Subjects

Speech authorities assert that the stammerer does not present a mentality markedly different from that of the non-stammerer, yet that he tends to become retarded because of his handicap. Greene[1] says, "As a matter of fact he possesses a very good mind, but it has become turned inward and is introspective." Martin[2] quotes Chervin, a French specialist, as follows: "Stammerers do not present an impaired mentality. Any tendency manifested by them toward dullness is the result of their conscious effort to avoid embarrassment or ridicule."

Baker[3] says, "A range of sixty points in IQ (from 70 to 130) includes practically all pupils at any age. Below the limit of IQ 70, about 2 per cent of the pupils are found-----
---At the upper extreme are found a few pupils whose IQ's are 130 points or higher." In a study of 1,000 unselected children to whom individual tests were given, Terman[4] found the tendency

1. Greene, James S. and Wells, Emilie J., "The Cause and Cure of Speech Disorders." p. 12. Macmillan, 1927.
2. Martin, Frederick and Louise, "Manual of Speech Training." p. 14. Ithaca, N. Y., 1926.
3. Baker, Harry J., "Characteristic Differences in Bright and Dull Pupils." p. 102. Public School Publishing Co., Bloomington, Illinois, 1927
4. Terman, Lewis M., "The Measurement of Intelligence." p. 67. Houghton Mifflin Co., 1916.

for the middle 50 per cent to fall approximately between 93 and 108. Following is a table showing the IQ distribution for the 160 stammerers in this study.

IQ's of 160 Stammerers as Determined by the Group Tests Listed Above

	IQ's Below 70	70-79	80-89	90-95	96-104	105-109	110-119	120-130	Above 130		
Rating	E-	E	D	C-	C	C	B	A	A	Median	
Boys	1	7	16	8	25	15	26	10	7	115	102
Girls		3	9	6	10	4	12	0	1	45	99.6
Totals	1	10	25	14	35	19	38	10	8	160	100.8

The range of IQ's in this distribution seems a normal one. It is in close agreement and slightly better than the Baker range of 70 to 130. However, this may be due to the kind of tests used to determine the IQ. The range of the middle 50 per cent is wider and slightly higher than that reported by Terman. This again may be a poor comparison because of the use of group tests for obtaining the IQ's in the above table. The median IQ for the 115 boy stammerers was 102. For boy controls it was 103. The median IQ for the 45 girl stammerers was 99.5, and for the girl controls it was 100. This indicates a fair degree of IQ equivalence for the study. Unfortunately, there was no city median available for a comparison with the entire school population. However, the medians are in fair agreement with that of 100 obtained for 688 boy and girl stammerers who had received speech training in the school year 1929-1930.

Mental Age in Relation to Grade Placement

The school grades represented in this study of stammerers and controls are those in which subject tests and inventory tests are given, and in which teachers' marks are available. It was found impractical to attempt to compare pupils beyond the ninth grade or below the fourth grade, therefore none are included in the study. The table below shows the grade range of both the experimental and control group. The stammerers only are counted thereon. Promotions are semi-annual in the Providence schools, hence B indicates the first term and A the second term in a school year.

Grades	4B	4A	5B	5A	6B	6A	7B	7A	8B	8A	9B	9A	Totals
Boys	0	8	11	10	17	5	23	12	14	10	1	4	115
Girls	5	0	5	12	7	4	3	5	1	3	0	0	45
Totals	5	8	16	22	24	9	26	17	15	13	1	4	160
Per cent	3.	5.	10.	14.	15.	5.6	16.	11.	9.	8.	1.	2.5	100%

The charts indicating grade placement and mental age of both stammerers and controls (Appendix 1 and 2) are based upon the assumption that the average normal child in Providence enters the first grade with a chronological age of six years and a like mental age. It is realized, however, that there must be a range of several years, and that these mental ages in the study are not true ones in the Binet sense. It has already been emphasized that a single group test is not sufficient for determining an intelligence quotient, therefore the following tables can be considered but a crude estimate of grade placement in

relation to mental age.

Mental Age in Relation to Grade Placement

Stammerers and Controls

Boys

Grade	Below M.A. Level		At M.A. Level		Above M.A. Level		Totals	
	Stam.	Cont.	Stam.	Cont.	Stam.	Cont.	Stam.	Cont.
9A	3	4	1	0	0	0	4	4
9B	0	0	0	1	1	0	1	1
8A	0	0	0	0	10	10	10	10
8B	5	4	1	3	8	7	14	14
7A	5	6	2	0	5	6	12	12
7B	3	4	3	4	17	15	23	23
6A	3	2	0	1	2	2	5	5
6B	7	8	1	2	9	7	17	17
5A	1	2	2	0	7	8	10	10
5B	3	4	3	1	5	6	11	11
4A	0	1	0	1	8	6	8	8
4B	0	0	0	0	0	0	0	0
Totals	30	35	13	13	72	67	115	115
Per cent	26.1	30.4	11.3	11.3	62.6	58.3	100.	100.

The above figures indicate that 26.1 per cent of the stammerers and 30.4 per cent of the controls are below the M. A. for their grade. This means that they are really achieving more than their M. A.'s indicate. A check-up revealed that twenty-two of the stammerers came from foreign language homes, and eight came

from homes where English only is spoken. Of the controls, twenty-one came from homes where a foreign language was spoken, and fourteen came from homes where English was spoken. It is possible in both cases that a language difficulty may have interfered with the achievement of a higher IQ score among the foreign language groups. Of the English speaking stammerers, six are very acute cases and two are dull problem boys. It is possible that the acute cases may have been emotionally upset at the time of the test, and consequently, may have achieved a lower score. 11.3 per cent of the stammerers and 11.3 per cent of the controls were found to be at the right grade for their Mental Ages. Of the stammerers, 62.6 per cent were above the M. A. level for the grade. Of the controls, 58.3 per cent were above the M. A. level for the grade. These last two groups apparently are not achieving up to their ability. This finding, if based upon an individual test of intelligence, would be of greater significance. It does not seem to bear out the retardation theory concerning stammerers, however, for almost as many of the controls are not achieving up to ability, the difference being only 3 per cent in favor of the controls.

Following is a similar table for the girls' group.

Mental Age in Relation to Grade Placement

Stammerers and Controls

Girls

Grade	Below M.A. Level		At M.A. Level		Above M.A. Level		Totals	
	Stam.	Cont.	Stam.	Cont.	Stam.	Cont.	Stam.	Cont.
9A	0	0	0	0	0	0	0	0
9B	0	0	0	0	0	0	0	0
8A	0	0	1	1	2	2	3	3
8B	1	1	0	0	0	0	1	1
7A	4	3	0	1	1	1	5	5
7B	1	0	1	3	1	0	3	3
6A	2	2	1	1	1	1	4	4
6B	3	3	0	0	4	4	7	7
5A	3	1	3	4	6	7	12	12
5B	1	1	1	2	3	2	5	5
4A	0	0	0	0	0	0	0	0
4B	0	1	1	0	4	4	5	5
Totals	15	12	8	12	22	21	45	45
Per cent	33.2	27.	17.7	27.	49.1	46.	100.	100.

The above figures indicate that 33.2 per cent of the girl stammerers and 27. per cent of the girl controls are below the ental ge for their grade. In other words they are achieving better than their mental ages indicate. 17.7 per cent of the stammerers and 27 per cent of the controls are at the right M. A. level for the grade. Therefore the table indicates that 50.9 per cent of the stammerers and 54 per cent of the controls are achieving up to their ability or better. 49.1 per cent of the

former, and 46 per cent of the latter are above the M. A. for the grade yet are not working up to their full capabilities. These findings tend to cast some doubt upon the belief that stammerers are more likely to be retarded than non-stammerers. Of the fifteen stammerers below the mental age for their grade, nine come from homes where a foreign language is used, and six come from homes where English only is used. Two of the English speaking group are colored children who are not acute stammerers. Two of the white English speaking girls are serious stammering problems, and two are extremely nervous children, but not acute stammerers.

Language Background of the 160 Stammerers in the Study

As the children were selected only when it was possible to secure a matching control, the language distribution of the group is a chance one. It will be noted that the boys are almost evenly divided into English and foreign language groups. The foreign language incidence is 1.6 to 1 when compared to the English speaking incidence among the girls. The distribution is shown in the following table:

	English Speaking		Foreign Language		Totals	
	No.	Per cent	No.	Per cent	No.	Per cent
Boys	81	50.5	79	49.5	115	100
Girls	17	37.8	28	62.2	45	100

Of the boys in the foreign language group, 25.2 per cent were of Italian parentage and 24.3 per cent were of Jewish, Polish, French, Portuguese, Swedish, Greek, Norwegian, or Syrian parentage. Therefore, 49.5 per cent of the boys might be said

to have speech conflict as a contributing or a causal factor in acquiring the defect. However, 93 per cent of these boys have been in school at least four years, and one would suspect that the tendency for a conflict between the school and the home language might have weakened by this time. Of the girls in the foreign language group, 13.3 per cent were of Italian parentage. The remaining 48 per cent had almost as varied a background as did the boys. 1.1 per cent of the girls had been in school for four years and were more than ten years of age, 26.6 per cent of the number being above the twelfth year. Of the boys, 55.5 per cent were above the twelfth year, hence physiological age may have been a significant factor in the retention or the aggravation of the defect.

Onset of the Defect

In most instances the stammerer or his parents place the onset of the defect at some definite time, and associate it with some outstanding event or experience in the child's career. However, all speech specialists are agreed that it has its beginning in early childhood. Conradi[1] quotes Chervin as saying that it usually begins between the ages of three and seven and very rarely later than ten or twelve. Conradi[2] asserts that in most cases it takes its beginning so far back in early childhood that no definite data can be obtained as to the first sign. In a later study[3] he says that many predisposing elements

1. Conradi, Edward, "Psychology and Pathology of Speech Development in the Child." p. 359 Pedagogical Seminary, Vol. II (pp. 328-380) 1904.

2. Ibid. p. 348.

3. Conradi, Edward, "Speech Defects and Educational Progress." Journal of Educational Psychology, Vol. III. pp. 35-38. 1912.

are found in the early speech of the child, "that the child has not yet fixed all the muscular coordinators to produce speech, hence may be easily influenced by physical indispositions and psychical disturbances such as fear and embarrassment." Blanton[1] says that the beginning of the defect is usually gradual, and that it is rarely noticed in young children, although often present. He believes it "very likely that the coordinational speech activities have been abnormal from the beginning." Fogerty[2] says, "The actual beginning of the trouble is very difficult to determine. Almost all children hesitate breathlessly when they are excited, because they are not yet expert speakers.-----The precise moment at which the child becomes conscious of this difficulty and feels that there is some sound which he cannot make is the real onset of true stammering."

In view of the above opinions one must conclude that the average stammerer has been a victim of the defect for a long period before he is brought to the speech specialist.

The children in the study reported the onset of the defect in their own cases as having appeared over a range of pre-school through the sixth school years. Tables which follow indicate the onset as reported for both boys and girls.

1. Blanton, Margaret, and Smiley, "Speech Training for Children." The Century Co., New York, 1924. p. 104.

2. Fogerty, Elsie, "Stammering." p. 12. E. P. Dutton & Co., Inc., 1930.

(1) Onset of the Defect--Boys

Time--grade	Pre-school	Grades						
		I	II	III	IV	V	VI	Totals
Foreign Language	34	14	1	1	9	1	1	61
English Language	22	12	4	3	7	6	0	54
Totals	56	26	5	4	16	7	1	115
Per cent	48.7	22.6	4.4	3.5	13.9	6.	.9	100

It will be noted from the above table that 48.7 per cent of the boys were stammering acutely enough to have the trouble apparent before entering the first grade at the age of six. The fact that the foreign language group outnumbers the English language group 1.5 to 1 in the pre-school years may indicate the possibility of speech conflict in kindergarten. However, in view of the opinions of Conradi, Fogarty, and Blanton on the very early onset of the defect, speech conflict would seem a contributing rather than a primary cause. The first grade seems a danger point for bringing out the defect according to the findings. Martin[1] claims that the average age for its inception coincides with learning to read in school. A significant rise in reported onset is noted in the fourth grade approximately at the age of nine. Terman and Almack[2] believe that the lower grades are most crucial as regards the development of the defect, "though the onset of puberty frequently brings about the aggravation of cases that already exist."

1. Martin, Frederick and Louise, "Manual of Speech Training." p. 13.

2. Terman and Almack, "The Hygiene of the School Child." p. 353.

(2) Onset of the Defect--Girls

Time--grade	Pre-school	Grades						
		I	II	III	IV	V	VI	Totals
Foreign Language	11	8	3	2	1	0	1	26
English Language	11	5	1	2	0	0	0	19
Totals	22	13	4	4	1	0	1	45
Per cent	48.9	28.9	8.9	8.9	2.2	0	2.2	100

The above table indicates that 48.9 per cent of the girls in the study were recognized stammerers before entering the first grade. This per cent is almost identical with that of the boys in Onset Table 1. Again a rise is noted in the first grade with a notable drop in the grades two through six.

(3) Comparison of Onset--Boys and Girls

Time	Pre-school		I		II		III		IV		V		VI	
Age	3-5		6		7		8		9		10		11	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Boys	56	48.7	26	22.6	5	4.4	4	3.5	16	13.9	7	6.	1	.9
Girls	22	48.9	13	28.9	4	8.9	4	8.9	1	2.2	0	0	1	2.2

Table 3 shows a direct comparison of the onset of the defect as reported by the boys and girls in the study. Terman and Almack[1] report an investigation by Wallin which showed that 64 per cent of his cases began to stammer before entering school, and 36 per cent before reaching the age of fourteen.

Comparison of Inventory Scores and Teachers' Marks

In the Providence Public School system a series of inven-

1. Terman and Almack, "The Hygiene of the School Child," p. 352.

tory tests are given each September. The results of these tests constitute a diagnostic study of pupil achievement in each subject, and determine largely the program of remedial instruction for individuals or for classes. These tests also reveal the need for regrading or reclassification. The following tests were used in September 1930:

Test	Form	Grades
New Stanford Arithmetic Computation	W	2-9
New Stanford Arithmetic Reasoning	W	4-8
New Stanford Language Usage	W	4-8
New Stanford Paragraph Meaning	W	2-9
New Stanford Primary Reading	W	2-3
New Stanford Word Meaning	W	7-9

The results of these tests with the subject marks entered by the teachers upon pupil report cards every five weeks of the term were available for each stammerer and control in the study, 230 boys and 90 girls in all. The mid-term subject marks, given as a letter rating of A, B, C, and F by the teachers, were given a number or score value of 90, 80, 70, and 60, respectively. The inventory scores were rated numerically in the same way, as 90, 80, 70, and 60. The ratings in both inventory tests and teachers' subject marks were averaged for each stammerer and his control and the average score or mean found for the total number of boy stammerers and controls and girl stammerers and controls. (Refer to Appendix 48 for personnel sheets of pupils in this

study.) The following table of means expresses briefly the relationship between the inventory and teacher mark average of both stammerers and controls.

Table of Means

	Boys		Girls		Boys and Girls	
	Inventory	Teachers' Marks	Inventory	Teachers' Marks	Inventory	Teachers' Marks
Stammerers	72.23	72.94	70.18	73.64	71.65	73.13
Controls	73.98	75.42	72.44	75.65	73.54	75.48
Differences	1.75	2.5	2.3	2.	1.9	2.3

It will be noted that the differences between means of the inventory and teacher mark averages are too slight to be of any great significance. The probable error of the difference of the inventory score means for the boy stammerers and non-stammerers was $\pm$.81 and the others followed along accordingly, a finding of no great significance. The general trend of the differences of the means in the table, though slight, is in favor of the non-stammering group. Whether or not the stammerers' speech handicap with its accompanying emotional upsets had any influence in causing this trend in the differences is a question. On the whole, they are too small to be of any significant value.

An investigation of each stammerer's inventory average and teacher mark average was made to determine his success in school subjects in relation to his inventory prediction. It was found that 43 of the 115 stammering boys were achieving from .4 to 18.2 points less in subject average than the

inventory tests had predicted. When this difference amounted to 7. or more points, it seemed significant enough to warrant further investigation. Sixteen boys came within this group. A personal interview with the boy and a check-up with his principal or teacher seemed to warrant the assumption that the speech defect, in so far as it had affected the personality adversely, might have contributed to some extent to poor achievment of 11 of the boys. In five cases it was felt that the wide range of junior high school subjects had lowered the subject average to some extent. The IQ range for the sixteen boys in the case investigation was from 84 to 139 with a mean of 118. and a median of 117. Only two IQ's fell below a score of 100.

A comparison of the stammering girls' inventory and teacher mark averages revealed that eleven girls were achieving from .6 to 12. points below the inventory prediction. However, but one warranted an investigation which indicated that the wide junior high school subject range seemed the major cause for her lower achievement.

A brief summary of each case which was investigated follows.

Boys

Case 5. Grade 9A C. A. 15-5 M. A. 14-4 IQ 93

14.5 Difference between inventory and subject average.

An acute chronic stammerer since infancy. Dull, discouraged type of boy. Parentage--Italian. Language conflict possible. Achieved promotion in slow group. Difference partly due to comparison of limited Inventory scores with too wide a subject range.

Case 12. Grade 8A C. A. 14-0 M. A. 17-0 IQ 122

9. Difference. Probably due partly to limited inventory scores and wide subject range of junior high school. Chronic stammerer. Onset pre-school. Home language--English. Mathematics C, Science C, Social Science C.

Case 19. Grade 8B C. A. 14-0 M. A. 17-0 IQ 137

14.5 Difference--Partly due to wide junior high school subject range. Pre-school case. An acute stammerer. Entered school at $5\frac{1}{2}$ years. Older sister a stammerer. Mathematics C, English C. Home language--English.

Case 24. Grade 8B C. A. 13-3 M. A. 15-6 IQ 117

9. Difference--Exceeded inventory average at end of term. Pre-school case. Chronic stammerer. Home language--English.

Case 25. Grade 8B C. A. 13-6 M. A. 15-6 IQ 115

8.5 Difference. Acute stammerer with facial tics. Parentage--Italian. Onset--pre-school. Unkempt, undersized, mischievous, pleasing personality. Social problem partly. Behavior may be compensatory for social inferiority. Failed in mathematics. Promoted.

Case 34. Grade 7A C. A. 12-8 M. A. 14-7 IQ 115

10.7 Difference. Acute chronic stammerer. Italian parentage. Onset in third year of age. Unstable, easily discouraged. Promoted on trial. Repeating English and Social Science.

Case 56. Grade 7B C. A. 14-4 M. A. 15-5 IQ 108

17.5 Difference--Partly due to wide subject range. Chronic stammerer. Born in Russia. Entered first grade at seven years. Promoted. C grade in English, Social Science, Science.

Case 53. Grade 7B C. A. 12-2 M. A. 14-2 IQ 117

15-7 Difference. Chronic stammerer. Underweight, listless. Reported onset when nine years old. Italian parentage--home language Italian, yet lives in American residential district. Youngest of six children, five are girls. Sarcastic, critical, seems discontented. Trial promotion. Failed in arithmetic, language, and history in the mid-term. Personality problem.

Case 48. Grade 7B C. A. 12-2 M. A. 16-5 IQ 135

7. Difference. Chronic stammerer, nervous rapid speech. Onset when nine years of age. Home language--English. Problem largely discipline and lack of effort. Pleasing personality, very mischievous. Failed arithmetic. On trial promotion. Achieving only C grade.

Case 47. Grade 7B C. A. 11-3 M. A. 15-2 IQ 139

14-4 Difference. Partly due to incomplete marks. Slight stammerer and lisper. Home language--English. Onset at eight years. Only child--shy, lacks initiative. Promoted. Average only C .

Case 52. Grade 7B C. A. 13-0 M. A. 15-6 IQ 136

8.7 Difference. Chronic stammerer, rapid, nervous, careless speech. Home language--English. Onset in Grade 2. Note: serious auto accident when seven years old. Shy, reserved boy. Failed arithmetic, but given full promotion.

Case 51. Grade 7B C. A. 12-1 M. A. 15-5 IQ 127

18.2 Difference. Acute stammerer. Pre-school case. English--home language. Entered from out of city. Failed arithmetic, language, geography in mid-term. Finally passed all subjects. On trial promotion. Principal believes teacher too severe a marker.

Case 63. Grade 7B C. A. 15-8 M. A. 13-2 IQ 84

11.8 Difference. Dull boy, discipline problem. Chronic stammerer. Born with deformed foot. Foot operation when six. Appendicitis and hernia operations the same year. Entered first grade at seven. Parents divorced at this time. Boy lives with father, brother, and grandmother. Failed mid-term in arithmetic, language, geography. Too old for grade socially. Mechanical interests. Ought to be in a trade school. Individual test needed.

Case 68. Grade 6A C. A. 12-8 M. A. 17-1 IQ 130

11.2 Difference. Chronic stammerer. Occasionally acute. Onset at eight when boy was sent to French boarding school after father's death. Small, undersized for

age, but well physically. Failed arithmetic. Teacher believes change of method a cause. Boy believes failure due to own indifference. Full promotion though below in arithmetic.

Case 79. Grade 6B C. A. 11-6 M. A. 11-7 IQ 101

9.8 Difference. Chronic case. Onset in third grade. English and French spoken at home. Parents separated. Mother works. Boy youngest child. Failed in history, geography, and spelling in mid-term. Given trial promotion.

Case 112. Grade 4A C. A. 10-2 M. A. 11-7 IQ 114

11.7 Difference. Acute, chronic stammerer. Onset--preschool. Principal believes chief difficulty is inattention. Boy is unstable and mischievous. Is the elder of two children. Both parents work.

Girl

Case 5. Grade 7A C. A. 13-0 M. A. 18 IQ 144

12. Difference. Acute stammerer, old for grade. Home language--Jewish and English. Russian parentage. Difference largely due to wide subject range. Grade C in mathematics and English.

Note: An acute stammerer is one who has acute difficulty in articulating at all times. A chronic stammerer may stammer at all times, but usually is not so seriously afflicted as an acute case.

An attempt was made to test the validity of the trend of the findings in the comparative study of the inventory and teacher mark averages which has been described. This time a direct comparison of individual inventory and subject scores in reading, language, and arithmetic of each stammerer and his equated control was made. The individual scores were given a numerical value of 9, 8, 7, 6, and so on. As the junior high school pupils were omitted from this comparison, the pupil numbers were reduced to 94 boys and their controls, and 44 girls with their controls. The grade range for these pupils was from 4B through 8A.

The individual inventory scores and subject scores, the teachers' marks, were totaled for each grade. The grade means were found, and these in turn were totaled and the means found for boy and girl stammerers and their controls. The following tables of means show the results of the findings in reading, language, and arithmetic.

Reading Means

	Boys		Girls		Boys and Girls	
	Inventory	Subject	Inventory	Subject	Inventory	Subject
Stammerers	7.42	7.38	6.78	7.18	7.1	7.28
Controls	7.52	7.92	7.07	7.95	7.29	7.93
Mean Differences	.10	.54	.29	.77	.19	.65

It will be noted that the mean differences are too small to be of any significance, for in every instance they are less than 1. Nevertheless, these differences, though slight,

are in favor of the controls. The boy stammerers were slightly poorer in subject score means than in inventory means. The girl stammerers were slightly better. Both boy and girl controls exceeded their inventory means.

Language Means

	Boys		Girls		Boys and Girls	
	Inventory	Subject Means	Inventory	Subject Means	Inventory	Subject Means
Stammerers	7.94	6.98	7.01	7.39	7.47	7.37
Controls	7.43	7.58	7.03	7.37	7.23	7.47
Mean Differences	.51	.60	.02	.02	.24	.10

Again every mean difference was found to be less than 1. Although the boy stammerers exceeded the boy controls in the language inventory mean by .51, their subject mean was below, a finding of slight significance, but nevertheless indicating that they were not equaling the inventory prediction. The girl stammerers and the boy and girl controls slightly exceeded their inventory means.

Arithmetic Means

	Boys		Girls		Boys and Girls	
	Inventory	Subject Means	Inventory	Subject Means	Inventory	Subject Means
Stammerers	7.51	7.06	6.55	6.83	7.03	6.99
Controls	7.56	7.16	6.96	7.14	7.26	7.15
Mean Differences	.05	.10	.41	.69	.23	.16

A comparison of the mean differences again shows them to

be less than 1. The boy stammerers, although exceeding the girl stammerers in both inventory and subject means, failed to equal their own inventory prediction. The difference of .45 is too slight to be of any great significance. Both boy and girl controls exceeded their inventory predictions.

On the whole this comparison of individual subject and inventory scores by means of the above tables did not reveal findings of any great significance. Nevertheless, the trend favored the control groups as in the previous study with one exception, the boy stammerers having exceeded the boy controls by .51 points in language inventory means. In every comparison the girl stammerers achieved more than their inventory prediction, and the boy stammerers achieved less. In every subject the controls achieved more than their inventory mean predicted.

Comparison of Chronological Ages with Providence Age-Grade Medians.

In view of the general belief that the stammerer is likely to be retarded from nine months to one year chronologically in school, a comparison of the chronological ages of the 160 stammerers and the 160 controls in this study was made with Providence Public School age-grade medians. It was found that 61 per cent of the boy stammerers and 68.7 per cent of the boy controls were at the median or from six months to one year younger than the median, and that 39 per cent of the boy stammerers and 31.1 per cent of their controls were from six months to three years above the age-grade median as is indicated in the table which follows.

Comparison with Age-Grade Medians of Providence School Children.

Boy Stammerers and Controls

Below Age Median				At Age Median				Above Age Median			
1 yr.-2 yrs.		6 mos.-12 mos.		1 yr.-2 yrs.		6 mos.-12 mos.		1 yr.-2 yrs.		6 mos.-12 mos.	
S	C	S	C	S	C	S	C	S	C	S	C
9	5	39	50	22	24	27	24	17	7	1	5
				Per cents							
8.	4.3	34.	43.4	19.1	21.	23.4	20.8	14.7	6.	.9	4.3

The findings for the girl stammerers and their controls were in fair agreement with those of the boys. Sixty-four and four tenths per cent of these stammerers were at or younger than the age-grade median, and 35.5 per cent of each were from six months to three years older than the median. These findings are shown in the table which follows.

Girl Stammerers and Controls

Below Age Median				At Age Median				Above Age Median			
1 yr.-2 yrs.		6 mos.-12 mos.		1 yr.-2 yrs.		6 mos.-12 mos.		1 yr.-2 yrs.		6 mos.-12 mos.	
S	C	S	C	S	C	S	C	S	C	S	C
1	2	9	10	19	17	11	11	4	5	1	0
				Per cents							
2.2	4.4	20.	22.2	42.2	37.7	24.4	24.4	8.9	11.1	2.2	0

The above findings indicate that the girl stammerers in this study are approximately as well placed as their controls

according to the Providence Public School age-grade medians. Of the boys, 5.2 per cent more of the controls are at the age-grade median or younger. The above findings tend to weaken the belief that stammerers are likely to be retarded chronologically. However, a much more extensive comparative study must be made to verify the above findings.

Summary of Part III.

1. This part of the paper was directly concerned with a study of the background of 160 stammerers, 115 boys and 45 girls, and a comparison of their actual school achievement with that of 160 equivalent controls matched in sex, school grade, home language background, and approximately the same mental age and social status.

2. The IQ distribution of both stammerers and controls seems a normal one. The median IQ for boy stammerers was 102, with the middle fifty per cent ranging from 91 to 115. The median IQ for the boy controls was 103, with the middle fifty per cent ranging from 89 to 114 IQ. The stammering girls' median IQ was 99.5 with the middle fifty per cent ranging from 88 to 112 IQ. The median IQ for girl controls was 100, with the middle fifty per cent ranging from 88 to 111 IQ. These intelligence quotients were obtained by means of Group Tests. Terman reports the middle fifty per cent in a normal distribution of IQ's to range from 93 to 108. His data were obtained by means of individual intelligence tests and are more reliable.

3. A study of grade placement of stammerers and controls in relation to mental age indicated that 37.4 per cent of the boy stammerers and 41.7 per cent of the boy controls were achieving up to their capabilities or better. The same study indicated that 50.9 per cent of the stammering

girls and 54 per cent of the non-stammering girls were achieving up to their capabilities or better. Sixty-two per cent of the stammering boys and 49.1 per cent of the stammering girls were above the mental age for the grade, and apparently were not achieving as much as might be reasonably expected of them. Fifty-eight and three tenths of the non-stammering boys and 46 per cent of the non-stammering girls were not achieving up to their full capabilities. These findings indicate that only 4.3 per cent more stammering than non-stammering boys were not achieving up to their best, a minor difference in favor of the controls. The difference for the girls was but 3.1 per cent in favor of the girl controls.

4. The question of the possible effect of a conflict between a foreign language and English which might interfere with the normal flow of speech, and through emotional upset in the nervous child cause stammering, seems plausible in view of the following findings. Forty-nine and five tenths per cent of the boy stammerers and 62.2 per cent of the girl stammerers came from foreign language homes and may have had the speech difficulty accentuated or prolonged because of conflict. However, a more thorough investigation of individual cases is necessary in order to come to a definite conclusion in this particular phase of the study.

5. Speech authorities agree that the defect is gradually acquired by the child of nervous temperament in the early

years of life and is often unrecognized as an abnormality until the second or third year of school life. An investigation of the time of onset in this study showed that 48.7 per cent of the boys and 46.7 per cent of the girls reported the onset in the pre-school years. Thirty and five tenths per cent of the boys and 46.7 per cent of the girls reported the onset in the first, second, or third grade. Twenty-eight per cent of the boys and 4.4 per cent of the girls reported onset in the fourth or fifth grades. These findings seem to indicate that girls are less likely to acquire the defect after the third grade and therefore are less likely to be handicapped by it.

6. An investigation and comparison of the inventory and teacher mark averages of each stammerer and control showed a very slight trend in favor of the non-stammerer. An investigation of sixteen individual cases showing a wide deviation from and below the inventory averages seemed to point to the speech defect as causal factor in so far as it had influenced the personality of the stammerer adversely in eleven cases. An investigation of the individual scores, both inventory and subject, in reading, language, and arithmetic, showed a very slight trend in favor of the non-stammerers.

7. A comparison of the chronological ages of the stammerers in this study with the age-grade medians of the city indicated that 39 per cent of the boy and 35.5 per cent of

the girls were from six months to three years over age for their grade. These findings were not of great significance for a study of the chronological ages of the non-stammering controls revealed exactly the same per cent of over ageness for the girls and but 5.2 per cent less of over ageness for the non-stammering boy controls.

IV. Conclusions

In this paper an attempt was made to investigate to some extent stammering and its influence upon the school achievement of children who are afflicted with it. It was found that the majority of speech specialists are in agreement as to the definition and description of the defect and its inhibitory effect upon the school achievement of the child. It is believed to be a functional disturbance, psychic in origin, which manifests itself by a halting defective type of speech or a complete temporary blocking of speech. Basically, its psychic cause is believed to be due to an anticipatory fear of the inability to speak in a certain situation. Therefore, it is reasonable to expect that the inner conflict caused by it must to some extent affect the stammerer's personality and interfere with his school success. With the exception of McDowell, all other investigators of retardation mentioned in this paper believe that the defect interferes with school progress to the point of causing nine months to one year of retardation.

In this investigation, in which each stammerer was paired with an equivalent control of like sex, school grade, language background, approximate mental ability, and social background, the findings were not in agreement with the retardation beliefs.

A comparison of inventory score means and teacher mark means of the 160 stammerers and their controls revealed but a slight difference in the means. This difference in each instance favored the non-stammerers. An attempt to test

the validity of this trend by a direct comparison of inventory and subject scores in reading, language, and arithmetic of each stammerer and his control again revealed a slight difference in favor of the controls. In both comparisons the differences were too slight to be of any great significance. Further and more careful research is necessary to determine the validity of like findings.

A comparison of the chronological ages of the stammerers in this study with the age-grade medians of Providence public school children indicated that 39 per cent of the boy stammerers and 35.5 per cent of the girl stammerers were from six months to three years overage for their grade. A like comparison of the chronological ages of the non-stammering controls revealed exactly the same per cent of over ageness for the girls and but 8.7 per cent less of over ageness for the boys, findings which weaken the significance of the over ageness of the stammering boys and girls in this study and tend to disprove the belief that the majority of stammerers are overage for their school grades. A much more extensive study is necessary to verify like findings.

From this investigation one can conclude that the stammerer does not present a markedly different mentality, that he seems to show up as well as the non-stammerer in school achievement, and shows no significant variation from the age-grade median which would warrant the belief that he is retarded to any great extent in school years. However, such a comparative study to determine the school achievement of

the stammering child does not appear to lend itself readily to the statistical type of investigation because of the nature of the speech abnormality which handicaps the stammerer. The problem is an individual one which varies according to the seriousness of the defect and the deviation from normal social adjustment. The case study method which would permit a more careful comparison over a long period of time would probably present more accurate findings. That the stammerer appears to succeed as well as the non-stammerer may well be due to the trend of modern education which endeavors to "fit the task to the child" and to the mental hygiene aspect of the corrective speech program which aims to remold and readjust the stammering child and place him upon an equal footing with his non-stammering classmate.

Mental Age and Grade Placement (Stammerers) Boys, 115; Girls, 45; Total, 160

Grades	Ages 8½-9		9-9½		9½-10		10-10½		10½-11		11-11½		11½-12		12-12½		12½-13		13-13½		13½-14		14-14½		14½-15		15-15½		15½-16		16-16½		16½-17		17-17½		17½-18		Totals	
	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G
9A																			1		1		1		1														4	
9B																											1												1	
8A																						1	1		1		1	1	1	1	1		3		2				10	3
8B			1												2	1	2		1		2				1		1		1		2				1				14	1
7A					1				2			1		2	2	1	2		1		2				1		1											1	12	5
7B					1						2	1			3	1	2	1	3		1		1		1		4		4		1								23	3
6A							1			1	2	1		1			1	1																	1				5	4
6B	1			1	1		1	2	4		1		4		3			1	1	3							1												17	7
5A					1	1		2	2	3	1	2	2	3	1	1	2		1																				10	12
5B					3	1	3	1			1	1	2	2	1		1																						11	5
4A							3		2				2		1																								8	
4B				1		2		2																																5
	1		1	2	7	4	8	7	10	4	7	6	10	8	13	4	10	3	7	3	6	1	3	0	5	0	9	1	6	1	4		3		4			1	115	45

Appendix 1.

Mental Age and Grade Placement (Controls) Boys, 115; Girls, 45; Total, 160

Ages		8½-9		9-9½		9½-10		10-10½		10½-11		11-11½		11½-12		12-12½		12½-13		13-13½		13½-14		14-14½		14½-15		15-15½		15½-16		16-16½		16½-17		17-17½		17½-18		Totals	
		B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G
	9A																					4																		4	
Grades	9B																							1																1	
	8A																						1	1	1	1		2			1	1		3				2		10	3
	8B			1										2		1	1			3		1				1		2				2		1						14	1
	7A													4	1	2	2		1	2		2				1		1					1							12	5
	7B									2		1		1		4	3	3		2		1		1				3		3		1		1						23	3
	6A						1	1			1	1		1	1			1	1													1								5	4
	6B	1	1	1	1	1	1	1		4		2		5			1	1			1		2							1										17	7
	5A					1		1	1		4	3	3	1	3	2	1	2																						10	12
	5B			2		2	1	1	2	2	1	1		1		2			1																					11	5
	4A	1				1		2		3						1																								8	0
	4B		1				1		2		1																													0	5
		2	2	4	1	5	4	6	5	11	7	8	3	15	5	12	8	7	3	7	1	8	3	3	1	3	0	8	0	4	1	5	1	5				2		115	45

Appendix 2.

Personnel of Study

Grades	Boys	Girls	Totals
9A	4	0	4
9B	1	0	1
8A	10	3	13
8B	14	1	15
7A	12	5	17
7B	23	3	26
6A	5	4	9
6B	17	7	24
5A	10	12	22
5B	11	5	16
4A	8	0	8
4B	0	5	5
	115	45	160

The following pages show the cross comparison of the 115 boy stammerers and their controls and the 45 girl stammerers and their controls.

Cross Comparison of 115 Boys in the Study

Case No.	IQ	C. A.	M. A.	Grade	Inv. Av.	Teacher Av.
1. (s)	114	8-11	10-2	4A	70.	69.2
(c)	114	9-3	10-7	4A	70.7	73.
2. (s)	112	9-4	10-5	4A	74.5	70.
(c)	112	8-10	9-11	4A	87.5	89.
3. (s)	106	9-10	10-5	4A	71.2	71.2
(c)	109	9-1	9-11	4A	63.2	49.
4. (s)	97	15-0	14-7	9A	64.	67.
(c)	97	14-4	13-11	9A	69.	78.
5. (s)	93	15-5	14-4	9A	66.5	52.
(c)	93	14-7	13-7	9A	63.	64.
6. (s)	92	14-2	13-1	9A	55.	78.6
(c)	94	14-10	13-11	9A	67.5	79.6
7. (s)	86	16-4	14	9A	60.	74.6
(c)	88	15-8	13-9	9A	54.	77.6
8. (s)	97	15-5	15	9B	60.	62.5
(c)	98	14-9	14-4	9B	71.5	68.6
9. (s)	135	12-10	17-4	8A	78.2	73.3
(c)	134	13-3	17-7	8A	76.5	84.
10. (s)	130	12-7	16-4	8A	83.2	85.
(c)	130	12-10	16-7	8A	84.5	75.6
11. (s)	125	13-6	16-11	8A	85.	76.6
(c)	125	13-3	16-8	8A	78.7	80.
12. (s)	122	14-0	17-1	8A	85.	76.
(c)	120	13-4	16-0	8A	85.	80.
13. (s)	120	13-10	16-7	8A	74.	74.
(c)	128	13-5	17-3	8A	75.	80.
14. (s)	115	14-8	16-10	8A	72.7	71.6
(c)	114	16-6	14-5	8A	78.7	76.6
15. (s)	111	12-7	14-0	8A	80.7	80.
(c)	112	12-10	14-4	8A	77.5	78.3
16. (s)	111	14-4	15-11	8A	70.	76.6
(c)	112	13-4	15-0	8A	70.7	75.

Case No.	IQ	C. A.	M. S.	Grade	Inv. Av.	Teacher Av.
17. (s)	104	15-0	15-4	8A	70.	76.
(c)	104	14-10	15-0	8A	68.	68.
18. (s)	103	14-4	14-9	8A	65.2	73.3
(c)	103	14-3	14-8	8A	69.5	70.
19. (s)	137	12-5	17-0	8B	92.5	78.
(c)	137	12-5	17-0	8B	92.5	76.
20. (s)	127	12-10	16-4	8B	85.7	84.1
(c)	128	12-10	16-5	8B	82.5	78.
21. (s)	125	12-7	13-7	8B	63.2	76.
(c)	125	12-10	13-9	8B	78.2	76.
22. (s)	121	13-6	16-4	8B	70.	64.
(c)	121	13-5	16-3	8B	84.	68.
23. (s)	118	12-5	15-4	8B	81.2	84.1
(c)	120	12-11	15-6	8B	80.	84.1
24. (s)	117	13-3	15-6	8B	85.	76.
(c)	117	13-2	15-5	8B	77.5	70.
25. (s)	115	13-6	15-6	8B	72.5	64.
(c)	113	13-0	14-8	8B	81.5	72.
26. (s)	106	13-1	13-11	8B	73.2	70.
(c)	105	12-7	13-3	8B	76.2	75.5
27. (s)	104	12-11	13-5	8B	74.2	76.2
(c)	101	12-11	13-1	8B	85.	82.6
28. (s)	98	13-1	12-10	8B	75.	71.
(c)	99	13-2	13-0	8B	71.2	78.
29. (s)	95	12-10	12-2	8B	66.	71.6
(c)	95	12-9	12-1	8B	76.5	86.
30. (s)	92	13-8	12-6	8B	50.	66.
(c)	92	12-9	11-8	8B	62.5	72.
31. (s)	85	14-9	12-6	8B	64.	66.
(c)	85	14-0	11-11	8B	64.	70.
32. (s)	69	14-3	9-4	8B	50.	65.6
(c)	64	14-1	9-1	8B	62.5	74.
33. (s)	121	12-9	15-5	7A	82.5	80.
(c)	124	12-4	15-4	7A	90.	82.5

Case No.	IQ	C. A.	M. A.	Grade	Inv. Av.	Teacher Av.
34. (s)	115	12-8	14-7	7A	74.	63.3
(c)	115	12-9	14-9	7A	75.	68.
35. (s)	109	12-8	13-10	7A	78.7	80.
(c)	109	12-2	13-4	7A	77.	80.
36. (s)	100	13-5	13-5	7A	69.5	76.6
(c)	104	13-1	13-7	7A	74.5	78.
37. (s)	106	13-0	13-9	7A	67.7	70.
(c)	105	12-10	13-7	7A	68.7	74.
38. (s)	97	13-0	12-8	7A	69.5	69.6
(c)	97	13-6	13-1	7A	69.7	78.
39. (s)	94	13-4	12-6	7A	82.	81.6
(c)	92	13-2	12-2	7A	67.7	68.3
40. (s)	93	13-4	12-5	7A	70.	72.
(c)	93	13-2	12-3	7A	54.	78.
41. (s)	83	14-8	12-4	7A	65.	62.
(c)	83	13-11	11-6	7A	65.	77.
42. (s)	82	13-4	10-11	7A	60.	71.6
(c)	83	14-2	11-7	7A	66.5	73.
43. (s)	72	15	10-10	7A	59.	70.
(c)	79	14-8	11-7	7A	60.	66.6
44. (s)	70	15-3	10-5	7A	52.5	66.
(c)	74	15-8	11-7	7A	52.	72.6
45. (s)	136	10-10	14-9	7B	90.	85.
(c)	137	11-7	15-10	7B	88.7	86.
46. (s)	136	11-5	15-10	7B	85.	88.3
(c)	137	11-7	15-6	7B	85.	88.
47. (s)	139	11-0	15-2	7B	90.	75.6
(c)	138	12-0	16-6	7B	90.	82.
48. (s)	135	12-2	16-5	7B	85.	78.
(c)	135	12-0	16-3	7B	82.5	80.
49. (s)	130	11-7	15-1	7B	75.	75.
(c)	130	11-10	15-11	7B	70.	71.6
50. (s)	131	11-7	15-6	7B	87.5	72.5
(c)	131	11-6	15-7	7B	90.	77.5

Case No.	IQ	C. A.	M. A.	Grade	Inv. Av.	Teacher Av.
51. (s)	127	12-1	15-5	7B	86.2	68.
(c)	127	12-6	15-11	7B	77.5	80.
52. (s)	119	13-0	15-6	7B	83.7	76.6
(c)	114	14-7	15-6	7B	84.5	72.5
53. (s)	117	12-2	14-2	7B	80.7	65.
(c)	116	11-6	13-4	7B	83.7	80.
54. (s)	112	12-1	13-6	7B	75.	79.6
(c)	112	12-3	13-8	7B	75.	80.6
55. (s)	110	12-2	13-5	7B	76.2	75.
(c)	114	11-10	12-6	7B	76.5	80.
56. (s)	108	14-4	15-5	7B	90.	72.5
(c)	109	13-2	14-4	7B	86.3	77.4
57. (s)	107	12-0	12-10	7B	74.5	83.3
(c)	107	11-7	12-5	7B	70.7	76.6
58. (s)	106	11-7	12-5	7B	71.3	71.7
(c)	108	11-9	12-8	7B	75.	76.6
59. (s)	99	12-5	12-4	7B	83.7	82.
(c)	101	12-10	12-11	7B	81.2	75.
60. (s)	98	13-7	13-4	7B	65.	67.8
(c)	98	12-6	12-5	7B	69.	76.
61. (s)	93	14-1	13-1	7B	68.2	65.
(c)	93	13-2	12-3	7B	68.2	80.
62. (s)	87	13-10	12-0	7B	62.5	66.6
(c)	87	13-5	11-8	7B	59.	59.6
63. (s)	84	15-8	13-2	7B	80.	68.2
(c)	86	15-6	13-4	7B	77.5	71.3
64. (s)	81	13-9	11-5	7B	65.	68.
(c)	81	13-1	10-7	7B	64.	70.
65. (s)	81	11-10	9-7	7B	69.	76.
(c)	83	12-9	10-7	7B	67.5	73.3
66. (s)	79	14-7	12-7	7B	69.5	71.3
(c)	79	14-3	12-8	7B	64.5	73.
67. (s)	79	14-5	11-5	7B	50.	65.
(c)	79	14-5	11-5	7B	63.	67.5
68. (s)	130	12-8	17-1	6A	84.5	73.3
(c)	130	11-1	16-1	6A	85.	81.2

Case No.	IQ	C. A.	M. A.	Grade	Inv. Av.	Teacher Av.
69. (s)	119	10-7	12-7	6A	82.5	81.6
(c)	117	10-9	12-7	6A	75.7	83.3
70. (s)	98	11-6	11-3	6A	76.2	82.
(c)	99	11-11	11-8	6A	74.7	78.
71. (s)	88	13-0	11-5	6A	65.	63.3
(c)	89	12-8	11-3	6A	71.7	76.5
72. (s)	73	13-9	10-1	6A	67.	66.6
(c)	79	13-5	10-7	6A	59.	65.8
73. (s)	139	10-11	15-2	6B	90.	86.3
(c)	144	10-3	15-9	6B	85.7	85.
74. (s)	108	11-1	12-0	6B	69.5	78.
(c)	108	10-9	11-7	6B	71.5	84.6
75. (s)	107	12-6	13-4	6B	73.2	75.
(c)	101	12-9	12-10	6B	78.	75.
76. (s)	107	11-2	12-0	6B	81.2	80.8
(c)	106	10-10	11-6	6B	65.7	68.
77. (s)	104	11-3	11-8	6B	80.	81.6
(c)	102	11-4	11-7	6B	80.	81.6
78. (s)	103	11-7	11-11	6B	81.2	76.6
(c)	103	11-5	11-9	6B	76.2	75.
79. (s)	101	11-6	11-7	6B	82.2	71.
(c)	107	11-0	11-10	6B	62.	78.3
80. (s)	99	12-8	12-6	6B	69.3	64.6
(c)	99	11-9	11-8	6B	70.7	73.
81. (s)	99	10-10	10-9	6B	70.7	76.3
(c)	99	11-10	11-9	6B	67.2	83.3
82. (s)	96	11-11	11-4	6B	62.	68.3
(c)	96	11-3	10-10	6B	76.5	70.6
83. (s)	92	11-8	10-9	6B	72.	75.
(c)	94	11-10	11-2	6B	63.2	81.6
84. (s)	85	12-9	10-10	6B	62.7	61.6
(c)	85	12-4	10-5	6B	65.	68.3
85. (s)	86	13-8	11-9	6B	57.	75.
(c)	84	11-9	9-11	6B	76.5	83.3

Case No.	IQ	C. A.	M. A.	Grade	Inv. Av.	Teacher Av.
86. (s)	83	13-0	10-9	6B	61.3	66.6
(c)	83	12-11	10-9	6B	61.5	70.
87. (s)	84	11-5	9-6	6B	68.6	73.
(c)	81	11-0	8-11	6B	74.5	75.
88. (s)	77	13-7	10-5	6B	69.5	74.6
(c)	74	14-4	10-7	6B	59.5	68.3
89. (s)	72	12-0	8-8	6B	61.5	66.6
(c)	74	12-6	9-3	6B	78.2	71.5
90. (s)	115	11-0	12-7	5A	84.5	85.
(c)	115	10-8	12-3	5A	80.	81.3
91. (s)	115	10-6	12-1	5A	67.	80.
(c)	112	10-10	12-8	5A	82.7	86.6
92. (s)	115	10-3	11-9	5A	72.7	75.8
(c)	112	10-3	11-6	5A	85.	86.6
93. (s)	112	11-3	12-7	5A	82.	76.3
(c)	112	11-2	12-6	5A	70.7	68.5
94. (s)	110	12-1	13-3	5A	80.	81.6
(c)	115	10-6	12-1	5A	73.	80.
95. (s)	99	10-9	10-8	5A	72.5	75.
(c)	98	11-5	11-3	5A	81.2	74.
96. (s)	97	12-2	11-10	5A	73.7	66.
(c)	103	11-0	11-4	5A	67.	80.
97. (s)	92	10-8	9-8	5A	66.5	68.
(c)	93	10-7	9-10	5A	75.2	68.
98. (s)	84	12-9	10-8	5A	63.2	69.6
(c)	85	12-1	10-3	5A	72.	69.1
99. (s)	70	12-4	8-8	5A	64.5	67.2
(c)	76	10-9	8-4	5A	77.	53.3
100. (s)	117	10-2	11-11	5B	69.	71.6
(c)	120	10-6	12-3	5B	77.	71.6
101. (s)	112	10-4	12-1	5B	77.	75.
(c)	113	9-11	11-9	5B	78.7	80.
102. (s)	107	11-9	12-7	5B	61.5	60.
	105	11-10	12-6	5B	67.	62.

Case No.	IQ	C. A.	M. A.	Grade	Inv. Av.	Teacher Av.
103. (s)	105	10-11	11-5	5B	61.5	70.6
(c)	105	10-9	11-4	5B	77.5	71.6
104. (s)	101	10-1	10-2	5B	68.2	73.3
(c)	100	10-5	10-5	5B	75.	71.6
105. (s)	100	9-11	9-11	5B	77.	77.6
(c)	100	9-11	9-11	5B	77.	73.8
106. (s)	99	11-11	11-9	5B	67.	72.5
(c)	96	11-2	10-9	5B	69.5	75.1
107. (s)	94	11-0	10-4	5B	71.2	71.6
(c)	94	10-1	9-6	5B	67.5	76.6
108. (s)	85	11-7-	9-11	5B	71.2	71.6
(c)	85	12-7	10-8	5B	67.7	78.3
109. (s)	88	10-11	9-7	5B	64.7	66.8
(c)	88	10-9	9-6	5B	62.5	61.3
110. (s)	78	13-0	10-2	5B	59.3	62.6
(c)	78	12-0	9-5	5B	69.5	69.8
111. (s)	129	9-5	12-2	4A	78.7	73.3
(c)	129	9-11	12-9	4A	86.2	71.6
112. (s)	114	10-2	11-7	4A	80.	68.3
(c)	114	9-7	11-0	4A	87.5	79.6
113. (s)	112	9-8	10-10	4A	65.	73.3
(c)	107	10-2	10-11	4A	79.5	83.
114. (s)	98	10-10	10-7	4A	72.5	77.5
(c)	96	10-9	10-4	4A	88.7	82.
115. (s)	90.	11-3	10-2	4A	70.	75.
(c)	90.	11-0	9-11	4A	68.7	78.

Cross Comparison of 45 Girls in the Study

Case No.	IQ	C. A.	M. A.	Grade	Inv. Av.	Teacher Av.
1. (s)	110	14-2	15-7	8A	74.2	78.
(c)	110	14-3	15-8	8A	80.	84.
2. (s)	106	14-6	15-4	8A	73.4	76.
(c)	106	13-6	14-4	8A	62.	75.
3. (s)	99	14-2	14-0	8A	65.	74.
(c)	98	13-10	13-7	8A	67.5	76.

Case No.	IQ	C. A.	M. A.	Grade	Inv. Av.	Teacher Av.
4. (s)	92	13-7	12-6	8B	61.2	74.
(c)	93	12-3	12-3	8B	59.5	75.
5. (s)	144	13-0	18-0	7A	90.	78.
(c)	141	11-5	16-	7A	83.	90.
6. (s)	100	11-11	11-11	7A	60.	69.6
(c)	103	12-5	12-10	7A	75.	78.6
7. (s)	85	13-2	11-3	7A	69.5	74.1
(c)	88	13-9	12-1	7A	75.7	76.3
8. (s)	117	12-3	12-10	7B	72.5	72.5
(c)	117	12-3	12-10	7B	76.5	78.7
9. (s)	91	12-4	11-3	7B	58.	70.
(c)	95	12-8	12-2	7B	73.3	77.6
10. (s)	86	14-4	12-4	7B	63.5	64.6
(c)	84	14-8	12-4	7B	63.7	81.6
11. (s)	88	13-2	11-9	7A	59.	68.5
(c)	88	13-5	11-11	7A	72.5	70.7
12. (s)	87	13-7	12-1	7A	62.	67.6
(c)	87	13-10	12-4	7A	50.	64.
13. (s)	102	11-11	12-0	6A	71.	71.6
(c)	100	12-7	12-7	6A	74.	71.3
14. (s)	95	13-4	12-7	6A	70.5	78.
(c)	93	12-2	11-8	6A	77.7	78.3
15. (s)	74	15-2	11-2	6A	75.	72.
(c)	76	14-2	10-7	6A	64.5	68.
16. (s)	117	10-11	12-9	6B	72.	75.1
(c)	111	10-10	12-4	6B	81.5	80.7
17. (s)	115	11-4	13-0	6B	77.	76.5
(c)	115	11-5	13-2	6B	59.5	71.4
18. (s)	114	11-9	13-5	6B	69.5	71.2
(c)	117	11-10	13-8	6B	86.2	86.2
19. (s)	112	12-1	13-6	6B	80.	75.
(c)	115	12-0	13-10	6B	81.2	85.
20. (s)	87	11-6	10-0	6B	61.3	70.
(c)	85	11-2	9-6	6B	72.5	68.
21. (s)	89	11-0	9-4	6B	65.	70.
(c)	89	11-2	9-6	6B	72.5	76.6

Case No.	IQ	C. A.	M. A.	Grade	Inv. Av.	Teacher Av.
22. (s)	78	12-9	9-11	6B	62.	68.
(c)	71	12-7	8-11	6B	58.7	68.
23. (s)	110	10-7	11-8	5A	78.7	84.1
(c)	106	10-7	11-3	5A	80.	74.6
24. (s)	109	10-6	11-9	5A	81.2	78.3
(c)	106	10-11	11-8	5A	82.2	85.
25. (s)	105	11-7	12-2	5A	73.7	69.3
(c)	104	11-10	12-4	5A	72.2	68.3
26. (s)	103	11-5	11-9	5A	58.7	70.
(c)	105	11-5	12-0	5A	64.	74.
27. (s)	99	11-1	11-0	5A	72.5	79.
(c)	98	11-3	11-0	5A	74.5	75.
28. (s)	98	11-5	11-3	5A	67.	68.8
(c)	98	11-6	11-4	5A	67.5	65.
29. (s)	98	10-6	10-4	5A	65.2	66.
(c)	99	10-5	10-4	5A	63.5	68.
30. (s)	95	11-6	10-11	5A	77.5	75.
(c)	94	12-2	11-5	5A	85.	78.3
31. (s)	88	11-9	10-4	5A	71.2	79.
(c)	88	12-0	10-6	5A	71.2	64.6
32. (s)	83	12-9	10-7	5A	77.5	78.
(c)	83	13-1	10-10	5A	81.2	80.
33. (s)	77	12-8	9-9	5A	69.5	69.9
(c)	77	13-8	10-6	5A	62.7	68.
34. (s)	117	10-2	11-11	5B	72.	71.6
(c)	115	10-10	12-6	5B	83.7	81.6
35. (s)	112	10-9	11-0	5B	75.2	85.8
(c)	112	10-8	10-11	5B	78.2	79.1
36. (s)	100	10-1	10-1	5B	69.7	72.
(c)	100	10-8	10-8	5B	67.5	71.6
37. (s)	100	11-6	11-6	5B	66.5	78.3
(c)	104	10-2	10-4	5B	65.	73.6
38. (s)	93	10-7	9-10	5B	59.	66.
(c)	93	10-2	9-6	5B	65.2	78.
39. (s)	118	8-10	10-5	4B	72.	78.6
(c)	114	9-1	10-4	4B	71.5	75.6

Case No.	IQ	C. A.	M. A.	Grade	Inv. Av.	Teacher Av.
40. (s)	116	9-6	11-0	4B	60.7	70.
(c)	113	9-6	10-9	4B	82.5	85.
41. (s)	115	9-1	10-5	4B	76.2	83.
(c)	114	9-1	10-3	4B	85.	84.
42. (s)	107	9-0	9-7	4B	73.7	78.
(c)	108	8-11	9-7	4B	75.	76.
43. (s)	97	9-8	9-4	4B	75.7	72.
(c)	96	9-0	8-8	4B	76.2	74.5
44. (s)	88	10-9	9-6	4B	76.2	65.
(c)	87	11-9	10-3	4B	65.7	68.
45. (s)	79	13-9	10-10	6A	69.	66.
(c)	79	12-4	9-10	6A	70.	72.

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